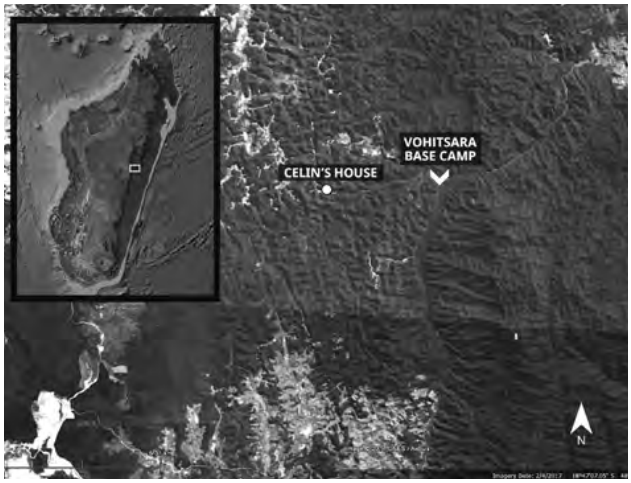

Fig. 1: Location of Marcelin's (abbreviated to Celin) house where egg feeding events by an aye-aye occurred in Ambosary, Madagascar.

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Non-forest matrix crossing in the blue-eyed black lemur *Eulemur flavifrons* (Gray, 1867)

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The population of the Critically Endangered blue-eyed black lemur *Eulemur flavifrons* found in the Ankarafa Forest in northwestern Madagascar is well-characterised (Volampeno *et al*., 2011). The area consists of primary and secondary forest fragments and supports the largest remaining connected population of *E. flavifrons* (Schwitzer *et al*., 2005, Schwitzer *et al*., 2007). In the current study, lemur groups within two neighbouring, unconnected forest fragments (72 m apart at their closest point) were being studied: Forest Nora (a highly degraded fragment) and Forest Guy (a less degraded fragment).

On one study day during the 2012-13 wet season, a group of lemurs were observed crossing a large stretch of non-forest matrix on the ground, showing terrestrial quadrupedalism as opposed to their usual arboreal movement. The group was identified as the Green group described by Volampeno *et al*. (2011), and was known at the time to consist of 12 individuals occupying a territory in the northeastern part of Forest Guy. The route taken by the group was tracked, GPS coordinates were plotted and further information was collected on vegetation cover and the distance that the group travelled.

The group was first located whilst feeding in a large mango tree at the very edge of Forest Nora and was tracked across the savannah right to the edge of Forest Guy, where they rested and fed again in a mango tree on the very eastern point of the fragment (Fig. 1). The route they travelled spanned a large open area between the two forests with sparse tree cover; the ground was covered mostly in long grass and small shrubs or young trees and there were very few substantially sized trees along the route. Further to this, the group crossed the main path leading into camp – a 10 m wide, well-established trail frequented by humans and zebu, which has been cleared of all vegetation. The route that the group took was re-enacted and it was found that the lemurs covered a total distance of 226 m between the two forests. Of this, 137 m was covered only on the ground where the group was led by the *Chef du groupe* (dominant female) and moved quadrupedally, where over 30 m at a time crossed scrubland and dirt paths. The remaining 89 m were crossed in the sparse areas of tree cover (Fig. 1).

The crossing of non-forest matrix over open savannah has not been previously documented in this species (C. Schwitzer, *pers. comm*). This behaviour is likely an adaptation to two things: changing resource availability/the depletion of resources within the usual home range, and between-group competition. As the observed group's home range was based in the mostly intact forest, in this instance the movement is more likely to have been driven by intense resource competition amongst neighbouring groups in Forest Guy and large group size. However, it could also be suggested that groups in highly degraded forest are also capable of travelling significant distances between fragments to exploit

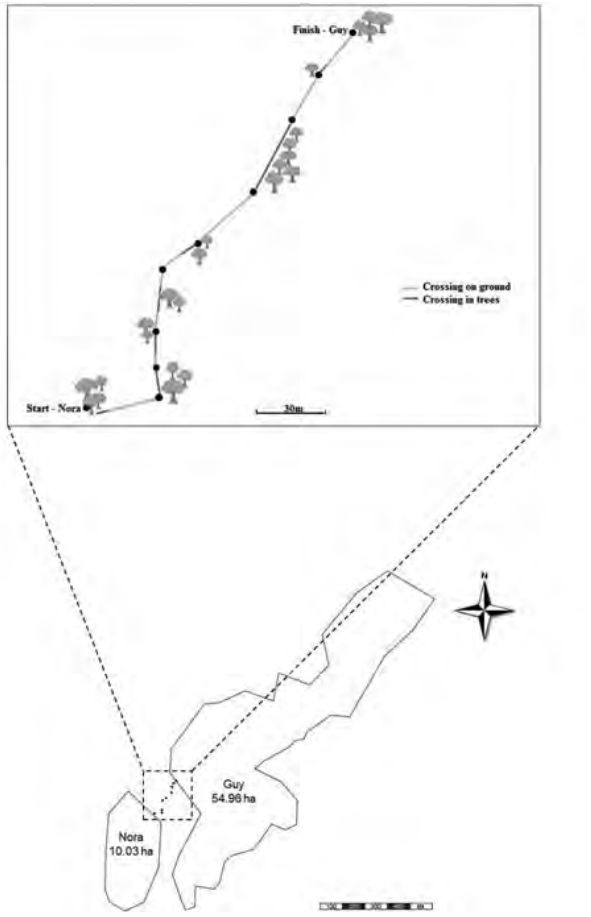

Fig. 1: The pathway of non-forest matrix crossed between two forest fragments (Forest Nora and Forest Guy) by a group of *Eulemur flavifrons*, and the proportion of the journey spent on the ground and in the trees.

more favourable conditions in nearby lesser-degraded forest. This expansion of the home range is another example of the species demonstrating a degree of habitat and behavioural flexibility.

The ability of the species to cross non-forest matrix between fragments has conservation implications. Navigating the patchy, mosaic fragments of the Ankarafa Forest is one of the toughest challenge the remaining population faces. The removal of all continuous forest has left a series of connected and unconnected forest fragments, and the ability of *E. flavifrons* groups to move between patches in search of food when resources have been depleted in one area is crucial to their survival. Habitat alteration often removes the understory so it is promising to see that the lemurs are adapting to movement on the ground (Moresco *et al.,* 2012). It has been found in numerous studies on primates that the survivability of a fragment-living species is positively correlated with their ability to cross non-forest matrix, utilise all areas of a fragment and move between patches (Onderdonk and Chapman, 2000; Ramanamanjato and Ganzhorn, 2001). This gives us hope that the viability of the *E. flavifrons* population in the Ankarafa Forest is higher than previously thought.

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Articles

Diet and behaviour of adult *Propithecus verreauxi* (Verreaux's sifaka) in southern Madagascar during the birth season

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Key words: *Propithecus verreauxi*, reproductive females, diet, behaviour, dry season, lactation

Abstract

The environment in which *Propithecus verreauxi* (common name: Verreaux's sifaka) is found is highly seasonal, arid, and frequently undergoes periods of drought. *P. verreauxi* compounds these challenges by giving birth during the dry season. Considering that lactation is the most energetically expensive reproductive stage, understanding how *P. verreauxi* females meet energetic requirements during the dry season is important. We examine the behaviour and diet of adult male and lactating female *P. verreauxi* to identify if sex differences exist. Continuous-time focal observations were conducted at Berenty Private Reserve, southern Madagascar, over six weeks early in the birth season. The number of bites of food an individual consumed of an item was recorded along with plant part and species. Males and females did not differ significantly in intake rate, the total amount of food consumed, or food types consumed. However, females did spend significantly more time feeding from one plant species (*Rhinorea greveana*). Females devoted a greater